

0170
1009

OIPE

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/832,659

DATE: 10/16/2001

TIME: 14:55:42

Input Set : A:\A064seq.app

Output Set: N:\CRF3\10162001\I832659.raw

3 <110> APPLICANT: BIOGEN, INC.
 5 <120> TITLE OF INVENTION: Interferon-Beta Fusion Proteins and Uses
 7 <130> FILE REFERENCE: A064PCTSEQ
 C--> 9 <140> CURRENT APPLICATION NUMBER: US/09/832,659
 C--> 10 <141> CURRENT FILING DATE: 2001-04-11
 12 <150> PRIOR APPLICATION NUMBER: 60/120,237
 13 <151> PRIOR FILING DATE: 1999-02-16
 15 <150> PRIOR APPLICATION NUMBER: 60/104,491
 16 <151> PRIOR FILING DATE: 1998-10-16
 18 <160> NUMBER OF SEQ ID NOS: 44
 20 <170> SOFTWARE: PatentIn Ver. 2.0
 22 <210> SEQ ID NO: 1
 23 <211> LENGTH: 1197
 24 <212> TYPE: DNA
 25 <213> ORGANISM: murine
 27 <400> SEQUENCE: 1
 28 atgagctaca acttgcttgg attcctacaa agaagcagca attttcagtg tcagaagctc 60
 29 ctgtggcaat tgaatgggag gcttgaatac tgcctcaagg acaggatgaa ctttgacatc 120
 30 cctgaggaga ttaagcagct gcagcagttc cagaaggagg acgccgcatt gaccatctat 180
 31 gagatgctcc agaacatctt tgctattttc agacaagatt catctagcac tggctggaat 240
 32 gagactattg ttgagaacct cctggctaatt gtctatcatc agataaacca tctgaagaca 300
 33 gtcctggaag aaaaactgga gaaagaagat ttcaccaggg gaaaactcat gagcagtctg 360
 34 cacctgaaaa gatattatgg gaggattctg cattacctga aggccaagga gtacagtcac 420
 35 tgtgcctgga ccatagtcag agtggaatc ctaaggaaact tttacttcat taacagactt 480
 36 acaggttacc tccgaaacga cgatgatgac aaggtcgaca aaactcacac atgcccaccg 540
 37 tgcccagcac ctgaactcct ggggggaccg tcagtcttcc tcttcccccc aaaacccaag 600
 38 gacaccctca tgatctcccc gaccctgag gtcacatgcg tgggtggtgga cgtgagccac 660
 39 gaagaccctg aggtcaagtt caactggtac gtggacggcg tggaggtgca taatgccaag 720
 40 acaaagccgc gggaggagca gtacaacagc acgtaccgtg tggtcagcgt cctcaccgtc 780
 41 ctgcaccagg actggctgaa tggcaaggag tacaagtgca aggtctccaa caaagccctc 840
 42 ccagccccc tcgagaaaac catctccaaa gccaaagggc agccccgaga accacaggtg 900
 43 tacaccctgc ccccatccc ggatgagctg accaagaacc aggtcagcct gacctgctg 960
 44 gtcaaaggct tctatcccag cgacatcgcc gtggagtggg agagcaatgg gcagccggag 1020
 45 aacaactaca agaccacgcc tcccgtgttg gactccgacg gctccttctt cctctacagc 1080
 46 aagctcaccg tggacaagag caggtggcag caggggaacg tcttctcatg ctccgtgatg 1140
 47 catgaggtc tgcacaacca ctacacgcag aagagcctct ccctgtctcc cgggaaa 1197
 49 <210> SEQ ID NO: 2
 50 <211> LENGTH: 399
 51 <212> TYPE: PRT
 52 <213> ORGANISM: murine
 54 <400> SEQUENCE: 2
 55 Met Ser Tyr Asn Leu Leu Gly Phe Leu Gln Arg Ser Ser Asn Phe Gln
 56 1 5 10 15
 58 Cys Gln Lys Leu Trp Gln Leu Asn Gly Arg Leu Glu Tyr Cys Leu
 59 20 25 30
 61 Lys Asp Arg Met Asn Phe Asp Ile Pro Glu Glu Ile Lys Gln Leu Gln
 62 35 40 45

ENTERED

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/832,659

DATE: 10/16/2001

TIME: 14:55:42

Input Set : A:\A064seq.app

Output Set: N:\CRF3\10162001\I832659.raw

```

64 Gln Phe Gln Lys Glu Asp Ala Ala Leu Thr Ile Tyr Glu Met Leu Gln
65      50                      55                      60
67 Asn Ile Phe Ala Ile Phe Arg Gln Asp Ser Ser Ser Thr Gly Trp Asn
68 65                      70                      75                      80
70 Glu Thr Ile Val Glu Asn Leu Leu Ala Asn Val Tyr His Gln Ile Asn
71                      85                      90                      95
73 His Leu Lys Thr Val Leu Glu Glu Lys Leu Glu Lys Glu Asp Phe Thr
74                      100                      105                      110
76 Arg Gly Lys Leu Met Ser Ser Leu His Leu Lys Arg Tyr Tyr Gly Arg
77                      115                      120                      125
79 Ile Leu His Tyr Leu Lys Ala Lys Glu Tyr Ser His Cys Ala Trp Thr
80                      130                      135                      140
82 Ile Val Arg Val Glu Ile Leu Arg Asn Phe Tyr Phe Ile Asn Arg Leu
83 145                      150                      155                      160
85 Thr Gly Tyr Leu Arg Asn Asp Asp Asp Asp Lys Val Asp Lys Thr His
86                      165                      170                      175
88 Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val
89                      180                      185                      190
91 Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr
92                      195                      200                      205
94 Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu
95                      210                      215                      220
97 Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys
98 225                      230                      235                      240
100 Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser
101                      245                      250                      255
103 Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys
104                      260                      265                      270
106 Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile
107                      275                      280                      285
109 Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro
110                      290                      295                      300
112 Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu
113 305                      310                      315                      320
115 Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn
116                      325                      330                      335
118 Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser
119                      340                      345                      350
121 Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg
122                      355                      360                      365
124 Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu
125                      370                      375                      380
127 His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
128 385                      390                      395
131 <210> SEQ ID NO: 3
132 <211> LENGTH: 549
133 <212> TYPE: DNA
134 <213> ORGANISM: murine
136 <400> SEQUENCE: 3

```

RAW SEQUENCE LISTING

DATE: 10/16/2001

PATENT APPLICATION: US/09/832,659

TIME: 14:55:42

Input Set : A:\A064seq.app

Output Set: N:\CRF3\10162001\I832659.raw

```

137 tccggggggcc atcatcatca tcatcatagc tccgggagacg atgatgacaa gatgagctac 60
138 aacttgcttg gattcctaca aagaagcagc aattttcagt gtcagaagct cctgtggcaa 120
139 ttgaatggga ggcttgaata ctgcctcaag gacaggatga actttgacat ccctgaggag 180
140 attaagcagc tgcagcagtt ccagaaggag gacgccgcat tgaccatcta tgagatgctc 240
141 cagaacatct ttgctatttt cagacaagat tcatctagca ctggctggaa tgagactatt 300
142 gttgagaacc tcctggctaa tgtctatcat cagataaacc atctgaagac agtcctggaa 360
143 gaaaaactgg agaaagaaga ttaccaccagg ggaaaaactca tgagcagtct gcacctgaaa 420
144 agatattatg ggaggattct gcattacctg aaggccaagg agtacagtca ctgtgcctgg 480
145 accatagtca gagtggaaat cctaaggaac ttttacttca ttaacagact tacaggttac 540
146 ctccgaaac 549

```

148 <210> SEQ ID NO: 4

149 <211> LENGTH: 183

150 <212> TYPE: PRT

151 <213> ORGANISM: murine

153 <400> SEQUENCE: 4

154 Ser Gly Gly His His His His His His Ser Ser Gly Asp Asp Asp Asp

155 1 5 10 15

157 Lys Met Ser Tyr Asn Leu Leu Gly Phe Leu Gln Arg Ser Ser Asn Phe

158 20 25 30

160 Gln Cys Gln Lys Leu Leu Trp Gln Leu Asn Gly Arg Leu Glu Tyr Cys

161 35 40 45

163 Leu Lys Asp Arg Met Asn Phe Asp Ile Pro Glu Glu Ile Lys Gln Leu

164 50 55 60

166 Gln Gln Phe Gln Lys Glu Asp Ala Ala Leu Thr Ile Tyr Glu Met Leu

167 65 70 75 80

169 Gln Asn Ile Phe Ala Ile Phe Arg Gln Asp Ser Ser Ser Thr Gly Trp

170 85 90 95

172 Asn Glu Thr Ile Val Glu Asn Leu Leu Ala Asn Val Tyr His Gln Ile

173 100 105 110

175 Asn His Leu Lys Thr Val Leu Glu Glu Lys Leu Glu Lys Glu Asp Phe

176 115 120 125

178 Thr Arg Gly Lys Leu Met Ser Ser Leu His Leu Lys Arg Tyr Tyr Gly

179 130 135 140

181 Arg Ile Leu His Tyr Leu Lys Ala Lys Glu Tyr Ser His Cys Ala Trp

182 145 150 155 160

184 Thr Ile Val Arg Val Glu Ile Leu Arg Asn Phe Tyr Phe Ile Asn Arg

185 165 170 175

187 Leu Thr Gly Tyr Leu Arg Asn

188 180

191 <210> SEQ ID NO: 5

192 <211> LENGTH: 60

193 <212> TYPE: DNA

194 <213> ORGANISM: Homo sapiens

196 <400> SEQUENCE: 5

197 gatctagcaa tgctgcctgt gctgccctcc tggctgcctt gaatgggagg cttgaatact 60

199 <210> SEQ ID NO: 6

200 <211> LENGTH: 51

201 <212> TYPE: DNA

202 <213> ORGANISM: Homo sapiens

RAW SEQUENCE LISTING

DATE: 10/16/2001

PATENT APPLICATION: US/09/832,659

TIME: 14:55:42

Input Set : A:\A064seq.app

Output Set: N:\CRF3\10162001\I832659.raw

```

204 <400> SEQUENCE: 6
205 tattatggga ggattctgca ttacctgaag gccaaaggagt actcacactg t          51
207 <210> SEQ ID NO: 7
208 <211> LENGTH: 76
209 <212> TYPE: DNA
210 <213> ORGANISM: Homo sapiens
212 <400> SEQUENCE: 7
213 aattgaatgg gagggctgca gcttgcgctg cagacaggat gaactttgac atccctgagg 60
214 agattaagca gctgca          76
216 <210> SEQ ID NO: 8
217 <211> LENGTH: 51
218 <212> TYPE: PRT
219 <213> ORGANISM: Homo sapiens
221 <400> SEQUENCE: 8
222 Ala Ala Thr Thr Gly Ala Ala Thr Gly Gly Gly Ala Gly Gly Cys Thr
223   1          5          10          15
225 Thr Gly Ala Ala Thr Ala Cys Thr Gly Cys Cys Thr Cys Ala Ala Gly
226          20          25          30
228 Gly Ala Cys Ala Gly Gly Ala Thr Gly Ala Ala Cys Thr Thr Thr Gly
229          35          40          45
231 Ala Cys Ala
232          50
235 <210> SEQ ID NO: 9
236 <211> LENGTH: 60
237 <212> TYPE: DNA
238 <213> ORGANISM: Homo sapiens
240 <400> SEQUENCE: 9
241 ttctccggag acgatgatga caagatgagc tacaacttgc ttggattcct acaaagaagc 60
243 <210> SEQ ID NO: 10
244 <211> LENGTH: 50
245 <212> TYPE: DNA
246 <213> ORGANISM: Homo sapiens
248 <400> SEQUENCE: 10
249 cgtcagagct gaaatcctag caaactttgc attcattgca agacttacag          50
251 <210> SEQ ID NO: 11
252 <211> LENGTH: 47
253 <212> TYPE: DNA
254 <213> ORGANISM: Homo sapiens
256 <400> SEQUENCE: 11
257 ggtggtctca catgagctac aacttgcttg gattcctaca aagaagc          47
259 <210> SEQ ID NO: 12
260 <211> LENGTH: 50
261 <212> TYPE: DNA
262 <213> ORGANISM: Homo sapiens
264 <400> SEQUENCE: 12
265 gccctcgagt cgaccttgct atcatcgctg tttcggagggt aacctgtaag          50
267 <210> SEQ ID NO: 13
268 <211> LENGTH: 21
269 <212> TYPE: DNA

```

RAW SEQUENCE LISTING

DATE: 10/16/2001

PATENT APPLICATION: US/09/832,659

TIME: 14:55:42

Input Set : A:\A064seq.app

Output Set: N:\CRF3\10162001\I832659.raw

```

270 <213> ORGANISM: Homo sapiens
272 <400> SEQUENCE: 13
273 caagcttgct agcggccgcg g                               21
275 <210> SEQ ID NO: 14
276 <211> LENGTH: 28
277 <212> TYPE: DNA
278 <213> ORGANISM: Homo sapiens
280 <400> SEQUENCE: 14
281 ggtggtctca catggcttga gaagctgc                       28
283 <210> SEQ ID NO: 15
284 <211> LENGTH: 20
285 <212> TYPE: DNA
286 <213> ORGANISM: Homo sapiens
288 <400> SEQUENCE: 15
289 aggtsmarct gcagsagtcw                               20
291 <210> SEQ ID NO: 16
292 <211> LENGTH: 36
293 <212> TYPE: DNA
294 <213> ORGANISM: Homo sapiens
296 <400> SEQUENCE: 16
297 ctgagctcat ttaccgcgag tccgggagaa gctctt             36
299 <210> SEQ ID NO: 17
300 <211> LENGTH: 33
301 <212> TYPE: DNA
302 <213> ORGANISM: Homo sapiens
304 <400> SEQUENCE: 17
305 agcttgctag cggccgcggc ctactggct tca                 33
307 <210> SEQ ID NO: 18
308 <211> LENGTH: 37
309 <212> TYPE: DNA
310 <213> ORGANISM: Homo sapiens
312 <400> SEQUENCE: 18
313 atacgcgtcg acgtttcgga ggtaacatgt aagtctg           37
315 <210> SEQ ID NO: 19
316 <211> LENGTH: 33
317 <212> TYPE: DNA
318 <213> ORGANISM: Homo sapiens
320 <400> SEQUENCE: 19
321 agcttgctag cggccgcggc ctactggct tca                 33
323 <210> SEQ ID NO: 20
324 <211> LENGTH: 51
325 <212> TYPE: DNA
326 <213> ORGANISM: Homo sapiens
328 <400> SEQUENCE: 20
329 tacacgtcga cgctgccacc accgccgttt cggaggtaac atgtaagtct g 51
331 <210> SEQ ID NO: 21
332 <211> LENGTH: 39
333 <212> TYPE: DNA
334 <213> ORGANISM: Homo sapiens

```

VERIFICATION SUMMARY

PATENT APPLICATION: US/09/832,659

DATE: 10/16/2001

TIME: 14:55:43

Input Set : A:\A064seq.app

Output Set: N:\CRF3\10162001\I832659.raw

L:9 M:270 C: Current Application Number differs, Replaced Current Application Number

L:10 M:271 C: Current Filing Date differs, Replaced Current Filing Date